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Labelling of equipment dispensers

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SUMMARY

A new labelling system for use on medical equipment dispensers is tested. This system uses one of the objects stored in each unit of the dispenser as the 'label', by attaching it to the front of the dispenser with tape. The new system was compared to conventional written labelling by timing subjects asked to select items from two dispensers. The new system was 27% quicker than the conventional system.

INTRODUCTION

In the accident and emergency (A&E) department a system which facilitates the rapid selection of medical equipment items from equipment dispensers and storage areas is desirable. A reduction in selection time has been achieved both in computing and in the aircraft cockpit by the use of symbol or 'icon' labelling, where they are widely established (Dudfield, 1988; 1991), and have been shown to improve user performance when compared to written displays (Rodgers 1986). This paper tests the application of an extension of symbol labelling for use in the A&E department.

METHOD

Two equipment dispensers were prepared. Each dispenser was made from 16 discarded suture boxes used as drawers and mounted in a frame. One dispenser was marked with conventional written labelling, the other labelled by attaching all or part of one of the objects stored in each drawer of the dispenser to the front of the drawer with clear tape (see Fig. 1).

Evaluation was performed using 10 hospital doctors as subjects. They were

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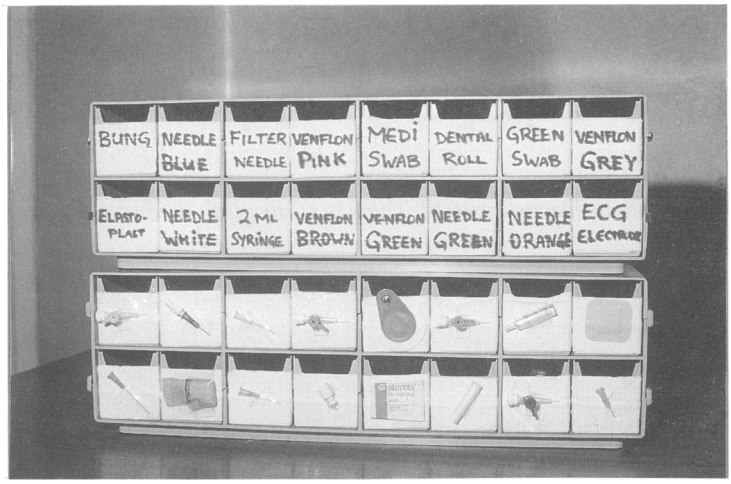

Fig. 1. The dispenser using the written labelling system is pictured on top of the dispenser using the object labelling system.

individually timed and asked to select five specified items for a hypothetical procedure first from one dispenser and then the other. The process was then repeated for a different five items and the dispensers tested in reverse order. Timing was started when the dispenser was first viewed, and stopped when all five items were in the subjects hand. The drawers in the dispensers were located randomly and moved after each test.

RESULTS

The mean choice reaction time for the object labelled dispenser was 27% quicker than the written labelled dispenser. Mean time taken for all tests for the five items on the object dispenser was 11.3 s (S.D. 2.7 s), which was significantly quicker (by Students *t*-test at the 5% level) than for the written dispenser, mean time 15.4 s (S.D. 4.7 s).

Comparison of times for the first and last tests on both dispensers showed a significant improvement (i.e. learning effect) for the object style dispenser but not for the other (Wilcoxon U-test, $P < 0.05$), suggesting that continued use of this dispenser would result in further improvement. All subjects reported that they would prefer to use the object-style dispenser, and found it easier and less frustrating to use.

DISCUSSION

The rapid selection of medical equipment items is vital in an emergency situation.

Furthermore, as items of equipment are selected probably many hundreds of times a day in a busy A&E department, a reduction in selection time will also improve efficiency and reduce frustration. In the A&E department a great array of equipment items may be stocked for the many different procedures which may be performed. A high turnover of staff occurs, especially amongst junior medical staff, and temporary staff are used frequently (e.g. 'agency' nurses). Therefore, familiarity with where items of equipment are stored cannot be relied upon to ensure rapid selection of items.

Although the time saved by the use of this labelling system was only of the order of 4 out of 15 s in this test, in a real situation the amount of time taken and saved would be expected to be much greater. This test was conducted under ideal conditions, the subjects were highly motivated, there were no distractions, they knew the items were in the dispenser and they were confronted with only a 16-unit dispenser.

In this study one alternative to the conventional written labelling was evaluated and a small number of subjects were used. A further assessment of performance could be made after a period of familiarization and use of the object-style labelling, in order to assess the final extent of improvement. Other labelling systems which could be explored include colour coding and the use of symbols, however these systems use fairly abstract representation of the object sought, and would rely, to some degree, on familiarity for effective use.

Evaluation of the efficiency of a labelling system in an emergency situation would obviously be difficult, however in other contexts, without a panic element, it has been shown that there is a 'speed accuracy trade off', i.e. as speed increases, errors increase (Wickens 1986).

This study has shown that (in an experimental context) object-style labelling is an improvement over conventional written labelling. Dispensers and storage areas which use written labels and which hide the objects from view may look neat and tidy but, it would seem they are ergonomically inferior to systems where the object itself can be seen or where object-style labelling is in use. Object-style labelling is cheap and easy to introduce and is recommended.

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